**BCS Cobra Invitational**

**Division B**

**Disease Detectives Test**

**February 3, 2018**

Team Number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Name(s) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

School Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Directions: For questions 1 to 10, please match each term with the correct definition given below.

1. \_\_\_\_ Mortality rate

2. \_\_\_\_ Nosocomial infections

3. \_\_\_\_ Virulence

4. \_\_\_\_ Descriptive epidemiology

5. \_\_\_\_ Zoonosis

6. \_\_\_\_ Reservoir

7. \_\_\_\_ Incubation period

8. \_\_\_\_ Incidence

9. \_\_\_\_ Specificity

10. \_\_\_\_ Sensitivity

A. The time interval from exposure to an infectious agent to the onset of symptoms of an infectious disease.

B. A measure of the frequency with which new cases of Illness, injury, or other health condition occurs among a population during a specified period.

C. Infections acquired at a hospital

D. The ability of a test, case definition, or surveillance system to identify true cases; the proportion of people with a health condition (or the proportion of outbreaks) that are identified by a screening test or case definition (or surveillance system).

E. A measure of the frequency of occurrence of death among a defined population during a specified time interval.

F. Which branch of epidemiology addresses person, place and time?

G. The ability of an infectious agent to cause severe disease, measured as the proportion of persons with the disease who become severely ill or die.

H. An infectious disease that is transmissible from animals to humans.

I. The habitat in which an infectious agent normally lives, grows, and multiplies, which can include humans, animals, or the environment.

J. The ability or a test, case definition, or surveillance system to exclude persons without the health condition of interest; the proportion of persons without a health condition that are correctly identified as such by a screening test, case definition, or surveillance system.

11. This type of outbreak occurs when one source has infected individuals over a prolonged period of time.

A. Point source outbreak

B. Continuing common source outbreak

C. Propagated Outbreak

D. None of the above

12. Malaria that exists permanently in a specific part of Africa can best be

described as an

A. Epidemic

B. Pandemic

C. Endemic

D. None of the above

13. Which of the following would decrease the incidence of a chronic disease in a population?

A. Prolonging the lives of the people with the disease

B. Secondary prevention

C. Primary prevention

D. Decreasing the case-fatality rate for the disease

14. What is the minimum internal temperature (°F) needed for Ground meats?

A. 145°F

B. 160 °F

C. 165 °F

D. 170 °F

Use the following scenario in answering questions 17 and 18. Epiville has a population of 100 people. Before a party, only one person was infected with Cholera. After the party, another 50 had fallen ill. The cholera victim and one other family member where not in attendance at the party, which was later investigated as an outbreak of cholera.

15. What was the attack rate for the outbreak?

A. 1/100

B. 51/100

C. 50/100

D. 50/98

16. What was the prevalence of Cholera in Epiville after the outbreak?

A. 1/100

B. 51/100

C. 50/100

D. 50/98

17. Which type of study is also called prevalence study?

A. Cohort

B. Case-control

C. Cross-sectional

D. Ecological

18. What is the 2nd step of an outbreak investigation?

A. Establish the existence of an outbreak

B. Do a site visit and see if unhealthy conditions are present

C. Develop a vaccine

D. Verify the diagnosis

19. A carrier is the source of the infection

A. True

B. False

20. Candidiasis is a fungal infection

A. True

B. False

21. Giardiasis is a parasitic disease

A. True

B. False

22. Strength of association and Temporality are part of the Hill’s criteria of causation

A. True

B. False

23. Cholera is a viral disease

A. True

B. False

24. The resistance of a population to an attack by a disease to which a large proportion of the members of the group are immune is referred to as...

A. Group resistance

B. Population immunogenesis

C. Herd immunity

D. The Panum Effect

Tie breaker…….

25. This microorganism is found in the environment, some foods and in the intestines of humans and animals. It is usually harmless and actually is an important part of a healthy human intestinal tract. Some strains of this pathogen cause diarrhea, abdominal cramps and vomiting or illness outside of the gastrointestinal tract. It can be transmitted through contaminated water or food, or through contact with animals. Name this organism and its classification (viral, fungal, bacterial or other ) ?

26. A study starts with 5000 people of these 125 have the disease in question. What is the prevalence of disease per 1000 people

A. 0.25

B. 2.5

C. 25

D. 250

27. In which type of study can a researcher measure both exposures and health outcomes of a given population simultaneously?

A. Prospective Cohort

B. Retrospective Cohort

C. Cross-Sectional

D. Case Control

E. Ecological

28. What is the goal of a randomized control trial?

A. To determine the efficacy of a treatment

B. To investigate whether an exposure is linked to an increased risk of disease

C. To investigate the effects of lifestyle choices on disease

D. To produce estimates of the prevalence of disease in a given population

29. What type of observational study design starts with risk factors and observes the outcome?

A. Case-Control

B. Cohort

C. Cross- Sectional

D. Ecological

30. What type of observational study design starts with the outcome and looks for risk factors?

A. Case-Control

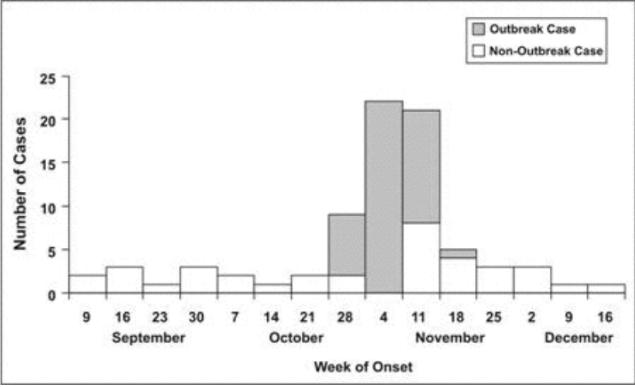
B. Cohort.

C. Cross- Sectional

D. Ecological

Directions: Examine the graph below and answer the questions.

Figure 1. Hepatitis A from Sub Shop — Massachusetts, 2015



31. What type of epidemic curve is shown above?

A. common persistent source

B. common point-source

C. common intermittent source

D. propagated source

32. When is the beginning of the outbreak?

A. Sept. 9

B. Oct. 28

C. Nov. 4

D. Nov. 18

33. Using the minimum incubation period of 15 days for hepatitis A, when is the likely date of exposure?

A. week of Sept. 16

B. week of Sept. 30

C. week of Oct. 14

D. week of Oct. 28

34. An outbreak of salmonella was caused by eating raw alfalfa sprouts. What are some precautions that should be taken to prevent this? List all that apply.

A. thoroughly cook sprouts

B. wash sprouts with soapy water

C. people with weakened immune systems should not eat raw sprouts

D. let the sprouts sit in the freezer for 10 minutes

E. pregnant women should not eat raw sprouts

Directions: Match each type of agent (listed on the left) with its type of classification (listed to the right). Classification types may be used more than once.

35. \_\_\_\_ bacteria

36. \_\_\_\_ noise A. biological

37. \_\_\_\_ car fumes B. chemical

38. \_\_\_\_ drugs C. physical

39. \_\_\_\_ light

40. \_\_\_\_ hazardous waste

41. \_\_\_\_ radiation

42. \_\_\_\_ fungus

43. \_\_\_\_ vibration

44. \_\_\_\_ food additives

45. \_\_\_\_ parasites

46. \_\_\_\_ viruses

Tie breaker………

47. List three individual characteristics that may modify the effects of environmental exposures (biological, chemical, and physical) that disease detectives need to think of in planning investigations.

48. Define cross contamination. Please give an example of cross-contamination.

Directions: Listed below is a table showing the results of an epidemiological study that examined salsa as possible source of hepatitis A infection.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Hepatitis | No Hepatitis | Total |
| Ate salsa | 218 | 45 | 263 |
| Did not eat salsa | 21 | 85 | 106 |
| Total | 239 | 130 | 369 |

49. What is the attack rate for those that ate salsa ?

A. 82.9%

B. 24.7%

C. 19,8%

D. 48.4%

50. What is the attack rate for those that did not eat salsa ?

A. 82.9%

B. 24.7%

C. 19.8%

D. 48.4%

51. Calculate the risk ratio (relative risk) for the data in the above table.

52. What does the relative risk mean in this case?

A new method for diagnosing pancreatic cancer is established. The test results are given below. Use this data for the questions below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Disease (number) | Non disease  (number) | Total  (number) |
| Test result positive (number) | 20 | 33 | 53 |
| Test result negative (number) | 10 | 37 | 47 |
| Total  (number) | 30 | 70 | 100 |

53. How many false negatives are in the table above?

A. 47

B. 37

C. 10

D. 20

E. 33

54. What is the sensitivity of the test?

A. 53%

B. 46%

C. 35%

D. 67%

Tie breaker…..

55. What do the calculations indicate about this diagnostic test?

For each scenario below answer the questions.

Patient A has arrived in a local ER complaining of diarrhea and flu-like symptoms. The nurse notices that the urine sample from Patient B is very dark. Patient B explains that about a month ago he visited Mexico and may have drunk from a questionable water supply.

56.  What food-borne illness is patient A suffering from?

A. Listeriosis

B. Salmonellosis

C. Hepatitis

D. B.cereus food poisoning

57.  How long can patient A expect the symptoms to last?

A. 2 weeks to 3 months

B. 24 - 48 hours

C. 4 -7 days

D. 2-10 days

Patient B is complaining of abdominal cramps, watery diarrhea, and nausea. These symptoms appeared 14 hours after the patient had beef stew for dinner.

58.  What food-borne illness is patient B suffering from?

A. Bacillus cereus food poisoning

B. Hepatitis

C. Salmonellosis

D. Campylobacteriosis

59.  How long can patient B expect the symptoms to last?

A. 2 weeks to 3 months

B. 24 - 48 hours

C. 4 -7 days

D. 2-10 days

Patient C is pregnant and comes into a local ER complaining of flu-like symptoms including fever, muscle aches, and nausea. She tells the nurse that she ate a sub sandwich from a local deli made with turkey and ham.

60.  What food-borne illness is patient C suffering from?

A. Shigellosis

B. Hepatitis

C. Listeriosis

D. Salmonellosis

61. What pathogen caused this illness in Patient C ?

A. Shigella

B. Hepatitis A

C. Listeria monocytogenes

D. Salmonella

Tie breaker--------

62. Explain briefly why this illness has an increased risk for patient C.

63. The recent multistate Outbreak linked to Coconut Tree Brand Frozen Shredded Coconut was caused by which microorganism ?

A. E.coli

B. Salmonella

C. Shigella

D. Hepatitis A

Match each microorganism with the correct illness it causes

64. \_\_\_\_\_\_\_\_ Traveler’s diarrhea A. Shigella

65. \_\_\_\_\_\_\_\_ Bacillary dysentery B. Norovirus

66. \_\_\_\_\_\_\_\_ Winter Diarrhea C. Enterotoxigenic E.coli

Directions: Match the foodborne disease to its most likely cause given below. Each choice is used once.

67. \_\_\_\_ botulism

68. \_\_\_\_ campylobacteriosis

69. \_\_\_\_ vibriosis

70. \_\_\_\_ cyclosporiasis

71. \_\_\_\_ E. coli 0157

72. \_\_\_\_ listeriosis

73. \_\_\_\_ salmonellosis

74. \_\_\_\_ trichinellosis

75. \_\_\_\_ leptospirosis

A. eating raw and undercooked poultry

B. eating food contaminated with the urine of infected animals

C. eating raw or undercooked eggs

D. eating raw or undercooked pork

E. eating fresh produce or drinking water contaminated with feces

F. eating raw or undercooked seafood

G. eating soft cheeses, hot dogs or deli meats

H. improper canning methods

I. eating undercooked hamburger